Mobile User Plane Message Encoding

draft-murakami-dmm-user-plane-message-encoding-05

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-00 to -01

- Define the Arg.Mob.Upmsg to carry the sequence number for GTP-U message
- Add SID flavor consideration to consider PSP/USP case
-01 to -02

• Refer RFC8754 instead of draft-ietf-6man-segment-routing-header
-02 to -03

- Add security consideration
-03 to -04 and -04 to -05

• Fix typo
Next Steps

• Comments?

• The document has been already stable.
• Calling for WG draft adoption
Backup
Motivation

• 3GPP User Plane needs to support the user plane messages associated with a GTP-U tunnel defined in [TS29281].
• In the case of SRv6 User Plane [I-D.ietsf-dmm-srv6-mobile-uplane], those messages are also required when the user plane interworks with GTP-U.
• The Tag field of SRH is capable to indicate different properties within a SID. Also, SRH TLV is capable to provide meta-data to the endpoint node.
• The capability of SRH can be possible to map the user plane messages into SRH.
• There is no additional headers or extension headers to be chained in the packet for carrying the user plane messages.
GTP-U message format

- Message Type for User Plane Message
  - Echo Request: 1
  - Echo Reply: 2
  - Error Indication: 26
  - End Marker: 254
Segment Header

<table>
<thead>
<tr>
<th>Segment List[0] (128 bits IPv6 address)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segment List[n] (128 bits IPv6 address)</td>
</tr>
</tbody>
</table>

// Optional Type Length Value objects (variable) //
Encoding of Tags Field

Bit 0 [B0]: End Marker

Bit 1 [B1]: Error Indication

Bit 2 [B2]: Echo Request

Bit 3 [B3]: Echo Reply
User Plane Information Element

```
<table>
<thead>
<tr>
<th>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>3GPP IE TLVs</td>
</tr>
<tr>
<td>3GPP IE TLVs</td>
</tr>
</tbody>
</table>
```

5GS Container TLV

- SRH TLV should be leveraged to carry user plane information element.
- Type must be assigned by IANA
### 3GPP IE TLV

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

```
+------------------------------------------------+
| Type | Length | Value                  |
+------------------------------------------------+
```

- 3GPP IE is encoded in this TLV.
- 3GPP IE TLV should be followed with 3GPP specification.
PSP Case

• In order to carry User Plane message over SRv6 network, SRH must be sustained over entire SRv6 network because User Plane message type and required information elements are encoded into SRH.

• If the penultimate segment is popping out SRH, i.e., PSP, User Plane message can not be carried in entire SRv6 network.

• In order to avoid this problem...
  • PSP must NOT be used in SRv6 network or
  • Another SRH should be added to carry User Plane message along with the outer IPv6 or SRH if PSP is mandatory.
• Q&A